
Paspalum volcanensis, a New Species of Subgenus *Anachyris* of *Paspalum* (Poaceae: Paniceae)

Fernando O. Zuloaga, Osvaldo Morrone, and Silvia Denham

Instituto de Botánica Darwinion, Casilla de Correo 22, San Isidro (1642), Argentina.

fzuloaga@darwin.edu.ar

ABSTRACT. A new species of Poaceae, *Paspalum volcanensis*, from southern Bolivia and northwestern Argentina, is described and illustrated. Its concavo-convex spikelets and upper lemma with conspicuous nerves are characters it shares with other species of subgenus *Anachyris* of *Paspalum*. A key to the species of the subgenus and comments on the delimitation of the new species are provided here.

In preparation of a treatment of the genus *Paspalum* L. for *Flora Neotropica*, examination of recent collections from Bolivia and Argentina has revealed a new species within subgenus *Anachyris* (Nees) Chase.

Paspalum volcanensis belongs to subgenus *Anachyris* (Nees) Chase, due to the presence of concavo-convex spikelets, and upper lemmas with conspicuous nerves on the abaxial surface. Within this subgenus, this new species is related to *P. usterii* Hackel: spikelets are pilose in both species, and the upper glume is always present. It differs from *P. usterii* by height, and inflorescence and spikelet size; the latter species grows in southern Brazil, eastern Paraguay, and northeastern Argentina, between 0 and 1200 m elevation, while *P. volcanensis* is present in southern Bolivia and northwestern Argentina, between 1000 and 2300 m elevation.

Paspalum volcanensis Zuloaga, Morrone & Denham, sp. nov. TYPE. Argentina. Jujuy: Dpto. Tumbaya, Volcán, cantera al SE del pueblo, 2100–2200 m s.m., 13 Feb. 1985, R. Kiesling, S. Botta, C. Ezcurra, M. Sánchez & E. Ulibarri 5170 (holotype, SI; isotypes, MO, US). Figures 1A–C, 2.

Culmi erecti, 45–60 cm alti. Laminae foliariae lanceolatae, 12–22 cm longae, 0.7–1.3 cm latae. Racemi 4–19, adscendentes vel patentes, infimi 4–9 cm longi; spiculis ellipsoideis, 2.5–3 mm longis, 1.1–1.2 mm latis; gluma superiore 3-nervi; lemmate inferiore 3-nervi, palea inferiore absente; anthoecio superiore ellipsoideo; lemmate fertili valde 7-nervi.

Caespitose perennials, with extravaginal innovations and short rhizomes covered by glabrous cat-

aphylls. Floriferous culms 45–60 cm tall, 2.4–3 mm diam.; nodes 2–3, brownish, glabrous or sparsely pilose; internodes 2.5–15 cm long, glabrous, striate, stramineous. Sheaths longer or shorter than the internodes, 9.5–22 cm long, striate, slightly compressed and keeled toward the distal portion, glabrous, one margin hirsute, the other glabrous or hirsute toward the distal portion. Ligules membranous, 2–3.5 mm long, pale brown, glabrous; pseudoligule a ring of whitish hairs up to 6 mm long. Blades lanceolate, 12–22 cm long, 0.7–1.3 cm wide, flat, ascendent, slightly divergent from the culm, rounded at the base, the apex acuminate, glabrous on both surfaces or the abaxial surface papillose-pilose, the margins papillose-pilose. Peduncles 9–25 cm long, terete, glabrous. Inflorescences terminal, exserted, 9–17 cm long, 4–9 cm wide; main axes 6–10 cm long, glabrous, ending in a naked point; racemes 4–19, ending in a spikelet, alternate to subopposite, divergent from the main axes, the lower ones 4–9 cm long; pulvini covered by whitish hairs, up to 0.5 mm long; rachises 1–1.6 mm wide, glabrous, brownish or purplish, the margins papillose-pilose; spikelets imbricate, distributed in 4 series; pedicels subterete, paired, glabrous, unequal, the upper ones 0.5–1.3 mm long, the lower ones half as long as the upper ones. Spikelets ellipsoid, 2.5–3 mm long, 1.1–1.2 mm wide, concavo-convex, pilose, pale and tinged with purple. Lower glumes absent. Upper glumes $\frac{3}{4}$ to equal the spikelet length, acuminate, membranous, dorsal surface sparsely pilose, with adpressed hairs more densely disposed toward the base, margins papillose-pilose, 3-nerved, the nerves conspicuous, one central and two submarginal. Lower lemmas equal to the upper anthoecium or slightly longer, membranous, glabrous, hyaline, 3-nerved, the nerves conspicuous, depressed at base. Lower paleas absent. Upper anthoecia concavo-convex, as long as the spikelets, indurated, glabrous, finely papillose. Upper lemmas 7-nerved, the midvein and lateral veins conspicuous. Upper paleas indurated, 2-nerved; lodicules 2, ca. 0.3 mm long, conduplicate, hyaline; stamens 3, the anthers 1.6–2.2 mm

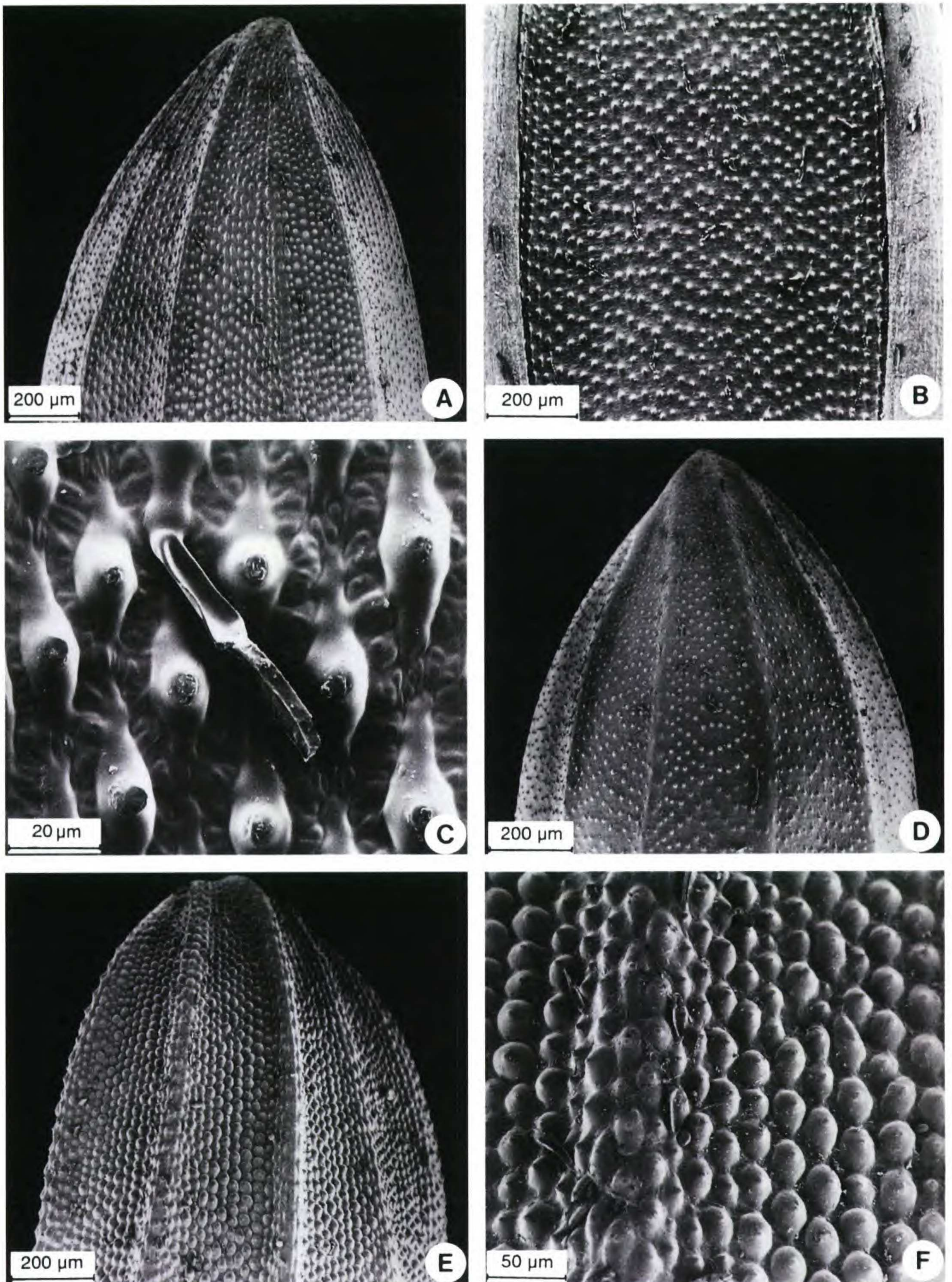


Figure 1. Scanning electron micrographs of the upper anthoecium of *Paspalum* species. A–C. *Paspalum volcanensis*.—A. Upper dorsal portion of the upper lemma. —B. Medium dorsal portion of the upper palea. —C. Detail of the surface of the upper palea with simple papillae regularly distributed and bicellular microhairs (Kiesling *et al.* 5171). —D. *Paspalum usteri*. Upper dorsal portion of the upper lemma (Montes 1932). E, F. *Paspalum malacophyllum*.—E. Upper dorsal portion of the upper lemma. —F. Detail of the dorsalsurface of the upper lemma, with simple, regularly distributed papillae and bicellular microhairs (Pires & Black 2293).



Figure 2. Holotype of *Paspalum volcanensis* Zuloaga, Morrone & Denham. —A. Habit. —B. Detail of ligule. —C. Portion of the inflorescence: rachis and paired pedicels. —D. Spikelet, dorsal view showing upper glume. —E. Spikelet, ventral view showing lower lemma. —F. Upper anthoecium, dorsal view. —G. Upper anthoecium, ventral view. —H. Upper palea with stamens and lodicules. —I. Caryopsis, embryo side. —J. Caryopsis, hilum side.

long, purplish; styles 2, the stigmas purplish. Caryopses ellipsoid, 2 mm long, 0.8 mm wide; hilums elliptical; embryos $\frac{1}{3}$ the length of the caryopses.

Distribution and ecology. This species occurs in department of Tarija, Bolivia, and in the province of Jujuy, northwestern Argentina, between 1000 and 2300 m elevation, on humid grasslands and the margins of rivers. According to Cabrera (1976), *Paspalum volcanensis* has been reported from the Yungas province and transitional areas between the Yungas and the Prepuneña provinces, in immature, permeable, rocky and sandy soils.

Chromosome number: $n = 20$ (Hunziker et al., 1998, under *Paspalum* aff. *malacophyllum*).

Paratypes. ARGENTINA. **Jujuy:** Dpto. Tumbaya, Volcán, camino a la cantera al SE de Volcán, 1010 m s.m., 23°56'S, 65°27'W, en suelo arenoso, borde de río, 15 Feb. 1997, Zuloaga, Morrone & Pensiero 5871 (MO, SI); Volcán, cantera al SE del pueblo, 2100–2000 m s.m., 13 Feb. 1985, Kiesling, Botta, Ezcurra, Sánchez & Ulibarri 5171 (MO, SI). BOLIVIA. **Tarija:** Prov. Méndez, 10.4 km SW of Tomatas, 5 km N of Tarija, Rincón de la Victoria, 2200–2300 m s.m., 21°32'S, 64°50'W, 10 Mayo 1983, Solomon 10630 (MO).

Subgenus *Anachyris* (Nees) Chase of *Paspalum* can be distinguished by its concavo-convex spikelets, the upper lemma having conspicuous nerves on the abaxial surface (Fig. 1). The new species agrees with these characters and therefore is included within this subgenus. Within subgenus *Anachyris*, *P. volcanensis* is related to *P. usterii*, the only other species of this subgenus with pilose spikelets with a developed upper glume, which is absent in the remaining species of the subgenus. *Paspalum usterii* differs by its long and robust rhizomes, inflorescences 12–35 cm long with 12–60 racemose branches, and spikelets 1.8–2.4 mm long, with the upper glume 1–3-nerved, reaching $\frac{1}{2}$ to $\frac{3}{4}$ the length of the spikelet and the nerves not manifest; this species grows in southern Brazil, eastern Paraguay, and Argentina, in the province of Misiones.

Paspalum volcanensis has on the abaxial epidermis of the palea and lemma bicellular microhairs of the “panicoid” type, together with simple, small papillae, regularly distributed in longitudinal rows; each papilla is associated with a long cell of the epidermis (Fig. 1A–C); a similar pattern was found

in the lemma and palea of *P. usterii* (Fig. 1D). *Paspalum malacophyllum* Trinius, *P. simplex* Morong, and *P. procurrens* Quarín are, on the contrary, distinguished by the presence of simple papillae as long as the epidermal cells, which cover the tangential external wall of the long cells (Fig. 1E, F).

The following key differentiates the currently recognized species of *Paspalum* subg. *Anachyris*:

1. Spikelets pilose; upper glume present; upper lemma and palea with inconspicuous nerves and a small papilla on each epidermal cell 2
- 1'. Spikelets glabrous; upper glume absent; upper lemma and palea with conspicuous nerves and a large papilla on each epidermal cell 3
- 2(1). Plants 1–2 m tall; rhizomes long and robust; culms lignified; inflorescences 12–35 cm long, 8–15 cm wide, with 12–60 racemose branches, the lower ones 6–12 cm long; spikelets 1.8–2.5 mm long; upper glume $\frac{1}{2}$ – $\frac{3}{4}$ as long as the spikelet, 1–3-nerved, the nerves not manifest; northeastern Argentina and southern Brazil *P. usterii*
- 2'. Plants 45–60 cm tall; rhizomes short; culms herbaceous; inflorescences 9–17 cm long, 4–9 cm wide, with 4–19 racemose branches, the lower ones 4–9 cm long; spikelets 2.5–3 mm long; upper glume $\frac{3}{4}$ to equal the length of the spikelet, 3-nerved, the nerves conspicuous; northwestern Argentina and southern Bolivia *P. volcanensis*
- 3(1). Plants stoloniferous *P. procurrens*
- 3'. Plants caespitose 4
- 4(3). Blades linear; axis of the branches of the inflorescence glabrous *P. simplex*
- 4'. Blades linear-lanceolate to lanceolate; axis of the branches of the inflorescence usually pilose *P. malacophyllum*

Acknowledgments. Fieldwork was carried out with grants from the National Geographic Society, #5657-96 and #6024-97. Laboratory work was done with a grant from Consejo Nacional de Investigaciones Científicas y Técnicas, CONICET, #4440/96. We thank Vladimiro Dudás for preparing the excellent line drawing.

Literature Cited

- Cabrera, A. L. 1976. Territorios fitogeográficos de la República Argentina. In L. R. Parodi (editor), Enciclopedia Argentina de Agricultura y Jardinería, ed. 2: 1–85, f. 1–31. Ed. Acme, Buenos Aires.
- Hunziker, J. H., F. O. Zuloaga, O. Morrone & A. Escobar. 1998. Estudios cromosómicos en Paniceae sudamericanas (Poaceae: Panicoideae). Darwiniana 35: 29–36.